

# Hidden Wealth

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International Macro History Online Seminar

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# Contents

## Introduction

- The Idea

- The Background

## Data

- Building the Data

- Taxes Due at Death

- The Return on Capital and Capital Income Tax

## Methodology

- Observed Wealth, by Surname

- Tracking Surname 'Dynasties'

- Wartime Destruction

- Estimating 'Expected' Wealth, 1920-2018

## Results

- Wartime Destruction of Dynastic Wealth

- The Relative Contribution of Wartime Destruction and Taxes to Wealth Accumulation: A Simple Simulation

- Estimated and Observed Lineage Wealth Accumulation

- What is the Propensity to Hide Wealth?

## How Much Wealth is Hidden? Surname Level Analysis

- The Proportion of Wealth Hidden and Newly Created Wealth, by Wealth Decile

- Is Hidden Wealth in Offshore Tax Havens?

- Hidden Wealth and Contemporary Outcomes: Housing Value and Oxbridge Attendance

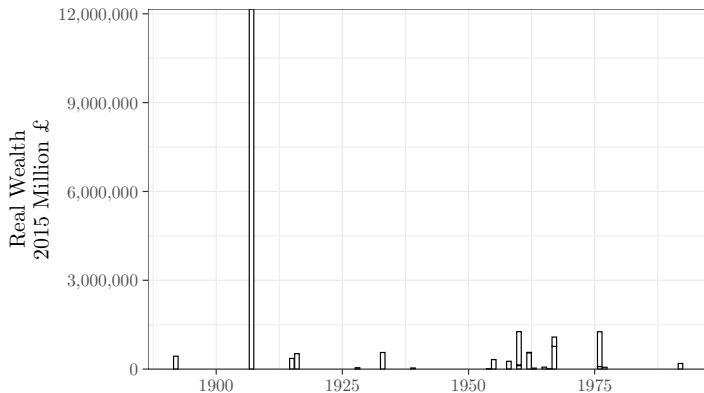
- 'True' Inherited Wealth and the Decline of Elite Wealth. Accounting for the 'Great Equalization'

## Conclusion

## Summary

- ▶ I observe all wealth at death in England, 1892-1992
  - ▶ Using this, I estimate 'hidden' inherited wealth, in *any* form
  - ▶ >20% is hidden
- ▶ This 'hidden' inherited wealth predicts appearance in:
- ▶ Offshore Banking Leaks of 2013-6,
  - ▶ House values in 1999,
  - ▶ Oxbridge attendance, 1990-2016.
- ▶ and eliminates 1/3 of the decline of top 10% wealth-share over the 20th century

# Wealth at Death



**Figure 1:** The Wealth at Death of Members of the Axxxxxxx Dynasty

*Source:* 100% PPR Calendar Sample.

# The Concept

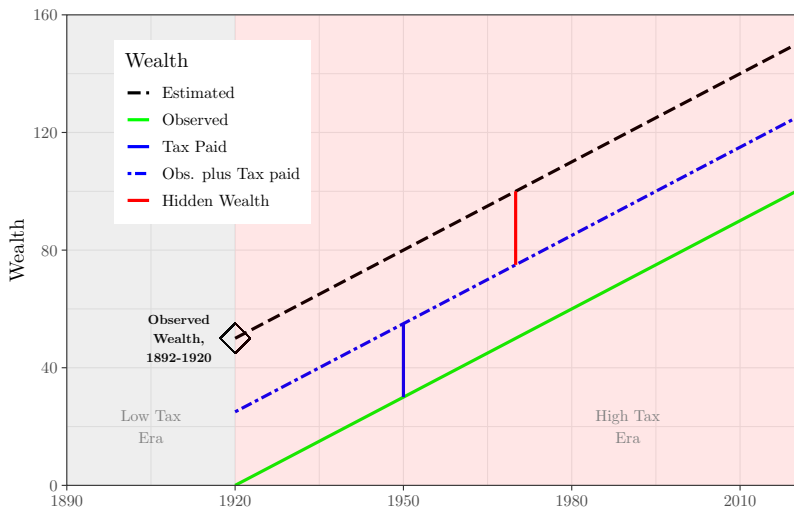


Figure 2: The Concept

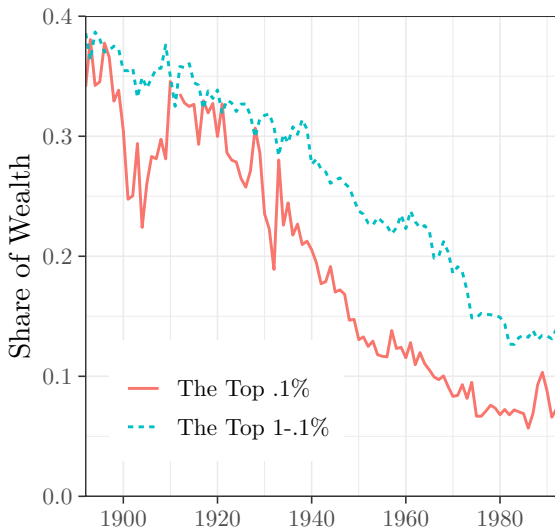


Figure 3: The Decline of the top .1% and .1-1%

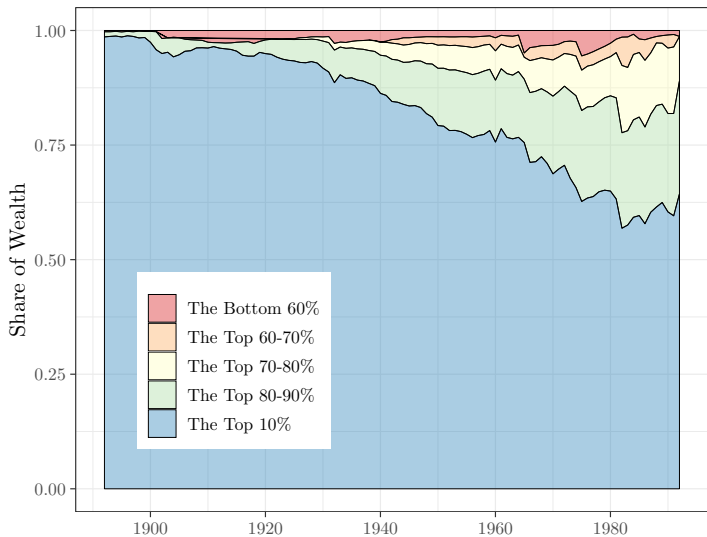


Figure 4: The Growth of 'Popular Wealth'

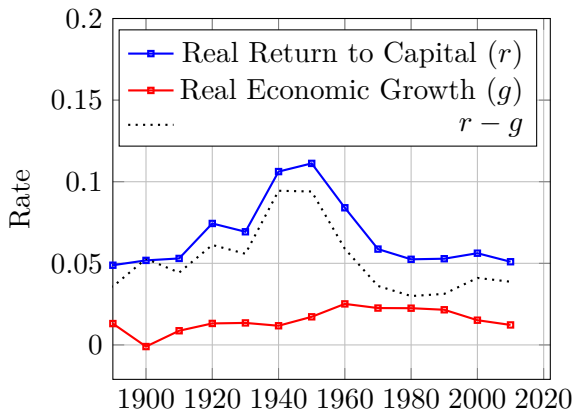


Figure 5:  $r$  and  $g$



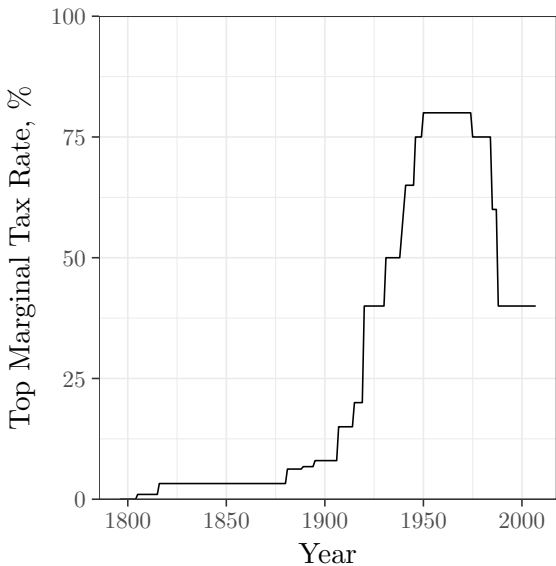


Figure 6: Inheritance Taxes in England

## Related Literature

- ▶ Piketty (2014), Lindert (1986), Harbury (1962); Harbury and McMahon (1973); Harbury and Hitchens (1976, 1977); Atkinson and Harrison (1978); Harbury and Hitchens (1979); Lindert (1986); Atkinson et al. (1989); Atkinson (2013); Alvaredo et al. (2018).
- ▶ Zucman (2013), analyzing systematic anomalies in the foreign assets and liabilities of countries, estimates that 8% of household wealth is held unrecorded in offshore tax havens. Alstadsæter et al. (2019), also using off-shore banking leaks and micro-data, from Norway, Denmark and Sweden, claim that “the 0.01% richest households evade about 25% of their taxes” Alstadsæter et al. (2019).

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## Conclusion

# Data

1. The Principal Probate Registry Calendar entries, 1892-1992
2. Taxes Due at Death
3. The Return on Capital and Capital Income Tax
4. The *Offshore Leaks Database*
5. 1881 Census of England and Wales,
6. the Complete Death Register, 1892-2007
7. Contemporary Outcomes: House Prices and Oxbridge Attendance

## The Principal Source: The Principal Probate Registry Calendars

- ▶ The data for analysis is a complete digitization of the Principal Probate Registry (PPR) Calendar for England and Wales from 1892-1992.
- ▶ The probate index records all those who died with wealth above a minimum threshold

## The Probate Threshold

Years	Nominal Probate Threshold	Source
1858-1900	£10	Turner 2010 p.628
1901-1931	£50	Turner 2010 p.628
1932-1964	£100	Atkinson and Harrison 1978, p.36*
1965-1974	£500	Atkinson and Harrison 1978, p.36
1975-1984	£1,500	Atkinson and Harrison 1978, p.36
1984→	£5,000	Turner 2010 p.628

Table 1: The Minimum Probate Threshold, 1858-2017

## Who's in?

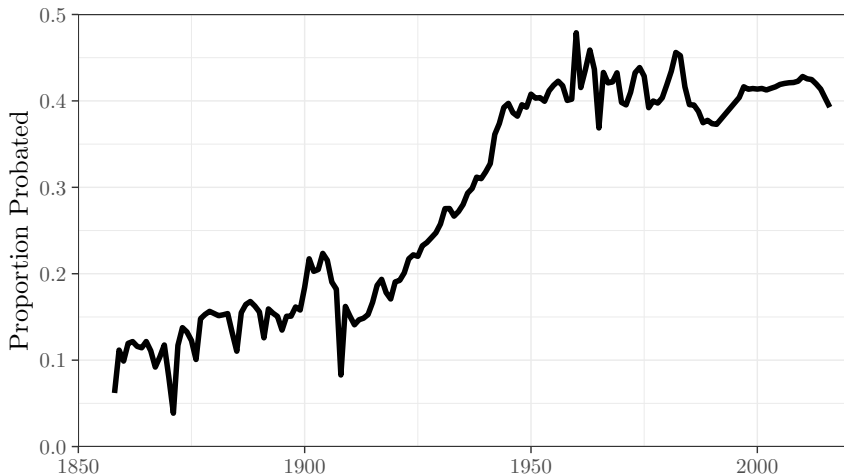


Figure 7: The Proportion Probated, 1858-2007

## Building the Data

- ▶ The original printed volumes of the Principal Probate Registry, calendar from 1858 to 1996, have been digitized as scanned images and are made available at <https://probatesearch.service.gov.uk>
- ▶ I downloaded all of them, 1.5 million image files



- 509 CUMING William Herbert of "Kest Tol" College-place Southampton retired major-general in H.M. army died 20 December 1904 Probate London 11 April to Robert Oatman Cumming retired colonel in H.M. army and Robert Staines Dalton Cumming captain in the Royal Navy Effects £1344 21s. 6d. *Reveries* £1804 17s. 6d.
- STEWART or GORDON**  
CUMMING Elizabeth Susanna. *See* "STEWART."
- 28 CUMMING Hugh Marjoribee of Belrose Shanklin Isle-of-Wight died 25 November 1904 Probate London 18 January to John Charles Cumming captain and John Durban collector Effects £247 3s. 6d.
- CUMMING John of 113 Chph Garden-road Sheffield died 25 June 1905 Probate Wakefield 31 August to Thomas Henry Cumming elementary-teacher Effects £205 4s. 3d.
- CUMMING John Morley of Puhali, Barr Assam India died 26 February 1905 Administration London 19 April to John Cumming journalist Effects £354.
- 1419 CUMMING Mary of 2 St. Stephen's-mansion Massachusetts-road Worcester Middlesex widow died 2 October 1905 Probate London 4 November to William Gordon Cumming colonel in H.M. army Effects £1342 9s. 8d.
- CUMMING Robert of 14 Merryfield-road Humphrey Millington died 28 July 1905 at Edinburgh. Confirmation of Susan Campbell Thomson Clark or Cumming widow William Oliphant Cumming solicitor and Mary Berwick Cumming and Jennie Green Cumming spinners and George Watt Sealed London 23 November.
- CUMMING Robert Octavia of "Cocher" Cheltenham retired colonel-in-chief in H.M. army died 7 October 1905 Probate Gloucester 27 November to Robert Staines Dalton Cumming captain in the Royal Navy Walter Charles Cumming clerk and Anne Elizabeth Cumming spinster Effects £109270 1s. 4d. *Reveries* £102297-9-0.
- CUMMINGS Ann of 2 Dredgery-croft York-street Seaman widow died 20 May 1905 at Terrace-road Seaman Administration London 27 November to Margaret Ann Ebery (wife of James John Ebery) Effects £20.
- CUMMINGS Catherine Emily of 115 Hamilton-street Newcastle-upon-Tyne spinster died 2 August 1905 Probate Newcastle-upon-Tyne 2 September to Alexander Mack Turnbull solicitor and Thomas Gray solicitor's clerk Effects £455 12s. 6d.  
*Clarendon* 276-7
- CUMMINGS Emily Sophie of Longley county Leicestershire widow died 20 March 1905 Probate Bellin to Edwin Tyrrell Cummings M.D. Sees London 14 November Effects £298 in English.
- CUMMINGS George John of 65 Park-road Newcastle-upon-Tyne gentleman died 18 November 1904 Probate Newcastle-upon-Tyne 10 January to John Dickson grocer and Alexander Mack Turnbull solicitor Effects £2479 7s. 3d.
- 1541 CUMMINGS Richard of the "Half Moon" inn Billingham county Durham died 12 December 1905 Probate London 27 December to Janet Hannah Cummings widow Effects £107 11s. 4d.
- CUMMINGS Sarah Jane of 2 Fordingham-road Southsea Portsmouth (wife of Richard Cummings) died 17 January 1905 Probate Winchester 10 February to the said Richard Cummings gentleman-boarding-schooler from the Royal Navy Effects £262 13s.
- 805 CUMMINGS Thomas of 15 Albert-embankment Lambeth Surrey died 22 March 1905 Probate London 29 June to Louisa Spicer (wife of Robert Spicer) Effects £45 14s. 1d.
- CUMMINS Isabella of 8 Tobity-terrace Falkonsh Cornwall (wife of Henry Boys Cummins) died 27 November 1905 Administration Bodmin 24 December to the said Henry Boys Cummins physician and surgeon Effects £400. *Reveries* 975-7-7
- CUMMINS Robert of 40 Newgate-street Bishop Auckland county Durham died 4 November 1905 Probate Durham 18 April to Mary Ann Cummins widow Effects £56 12s. *Reveries* 1636-12-
- 938 CUMNER Thomas of 15 Prince-street, Deptford Kent, died 5 March 1905 Probate London 27 July to John Stagg warehouseman Effects £15 6s.
- CUNDELL Charles John of Houghton-le-Skerne Darlington died 19 January 1905 Administration Durham 28 February to Jane Cundell widow Effects £211.
- CUNDELL Leonard of Hingwood Beckhams probationer died 14 October 1905 Probate Oxford 22 December to Henry Stratton Cundell bank-manager and William Henry Cundell agent Effects £1919 18s. 6d.
- CUNDILL George of Soughlegham Yorkshire farmer died 4 November 1905 Probate York 16 December to Robert Cundill and George Arthur Cundill farmers Effects £210 11s.
- CUNDY Francis of the "Gables" Watling St. Annual Cornwall retired farmer died 13 July 1904 Probate Bodmin 8 July to Annette Rockbery step-daughter and Emma Horatio Richards general-servant Effects £1274 11s.
- 936 CUNDY the deceased Henry George of "St. Margaret's" Shildon Kent clerk D.D. died 6 June 1905 Probate London 11 July to Robert Hanco captain and Richard Hovatt barrister-at-law Effects £2039 3s. 11d. *Reveries* 5230-9-4
- CUNDY Robert of the Foxe-courtyard-breast-ashlym Carmarthen died 20 August 1905 Administration London 28 September to Emma Jane Jones (wife of Thomas Jones) Effects £244 14s. 10d.

# 1905.

509

**CUMING** William Herbert of "Nani Tal" College-place Southampton retired major-general in H.M. army died 20 December 1904 Probate **London** 11 April to Robert Octavius Cumming retired colonel in H.M. army and Robert Stevenson Dalton Cumming captain in the Royal Navy Effects £19416 17s. 8d. Resworn £19856 17s. 8d.

**STEWART or GORDON**

**CUMMING** Elizabeth Newton. See "STEWART."

28

**CUMMING** Hugh Macpherson of Belmont Shanklin Isle-of-Wight died 26 November 1904 Probate **London** 18 January to John Charles Cumming esquire and John Durham solicitor Effects £849 3s. 4d.

**CUMMING** John of 113 Club Garden-road Sheffield died 23 June 1905 Probate **Wakefield** 11 August to Thomas Henry Cumming elementary-teacher Effects £285 4s. 2d.

**CUMMING** John Morley of Pathali Ram Assam India died 28 February 1905 Administration **London** 19 April to John Cumming journalist Effects £254.

1419

**CUMMING** Mary of 3 St. Stephen's-mansions Monmouth-road Bayswater Middlesex widow died 2 October 1905 Probate **London** 6 November to William Gordon Cumming colonel in H.M. army Effects £1242 0s. 9d.

**CUMMING** Robert of 14 Murrayfield-road Murrayfield Midlothian died 28 July 1905 at Edinburgh Confirmation of Janet Campbell Thomson Clark or Cumming widow William Oliphant Cumming solicitor and Mary Berwick Cumming and Jessie Grace Cumming spinsters and George Watt Sealed **London** 23 November.

**CUMMING** Robert Octavius of "Coulter" Cheltenham retired lieutenant-colonel in H.M. army died 7 October 1905 Probate **Gloucester** 17 November to Robert Stevenson Dalton Cumming captain in the Royal Navy Walter Charles Cumming cleric and Annie Elizabeth Cumming spinster Effects £109270 1s. 4d. Resworn £108,291-9-0.

**CUMMINGS** Ann of 3 Dewsbury-court York-street Swansea widow died 20 May 1905 at Terrace-road Swansea Administration **London** 27 November to Margaret Ann Ellery (wife of James John Ellery) Effects £30.

**CUMMINGS** Catherine Emily of 119 Hamilton-street Newcastle-upon-Tyne spinster died 2 August 1905 Probate **Newcastle-upon-Tyne** 9 September to Alexander Mark Turnbull solicitor and Thomas Gray solicitor's-clerk Effects £456 12s. 6d. Resworn £ 716 " 7 " 0

**CUMMINGS** Emily Sophia of Lurganboy county Leitrim widow died 30 March 1905 Probate Ballina to Edwin Tyrrell Cummings M.D. Sealed **London** 14 November Effects £208 in England.

**CUMMINGS** George John of 32 Park-road Newcastle-upon-Tyne gentleman died 16 November 1904 Probate **Newcastle-upon-Tyne** 10 January to John Ditchburn grocer and Alexander Mark Turnbull solicitor Effects £2679 7s. 3d.

## Building the Data

- ▶ Optical Character Recognition (OCR) was performed for each of the index pages using *ABBYY* fine-reader 12 software.
  - ▶ Over 1, 500, 000 images were collected into 504 PDF files of 2,000 pages each. This process was also automated.
- ▶ The OCR process resulted in 504 'dirty' (unformatted, full of duplicates) text files. These files were merged into 10 larger text files.
- ▶ Next the text patterns underlying the PPR Calendar entry structure were deduced by inspection

**WOODHAMS** Sarah. 16 January. **The Will of** Sarah Woodhams late of 61 Rose-Hill-terrace Brighton in the County of Sussex Personal Estate **£1,210**. Spinster who **died** 25 December 1883 at 61 Rose-Hill terrace was proved at L6W6S by Edward Saxby Woodhams of 12 East-street Brighton Broker the Nephew and Emma Scrase of 10 ..Brunswick-place North Brighton Widow the Sister the Executors.

**LOCKETT** John of 1 Bath-street Burslem Staffordshire leather cutter **died** 13 November 1893 **Probate** Lichfield 21 December to Mary Lockett widow Effects **£148 6s. 7d.**

**ASTON** Alfred Charles of 3 St. Annes Road Willenhall Staffordshire **died** 20 August 1906 **Probate** Birmingham 19 October to James Henry Edwards floor moulder and Joseph Price production controller. **£1772**.

**LICCINS** Edward of 150 Whitmore-park Holbrooks-lane Coventry **died** 19 April 1929 **Probate** Birmingham 8 June to Maria Liggins widow. **Effects £48 8s.**

**KNEEBONE** Julia of 89 Meneage-street Helston Cornwall widow **died** 12 May 1934 **Administration** Bodmin 18 June to Harold Dennis Kneebone hotel proprietor. Effects **£86 ls. 7d.**

**ALLIX** Elizabeth Barbara of 4 Hanover Court Hanover-street London W.1 spinster **died** 19 April 1945 **Probate** Llandudno 28 August' to Martins Bank Limited Effects **£53380 ls. 3d.**

**LACEY** John Ethelbert of 35 Wynfield-road Leicester **died** 30 November

<i>Description</i>	<i>Example</i>
A sequence of capital letters, delimits a new record/line	KAYE
delimits address	Willie " of "
delimits death date	Church View Kirkburton " died " 12 December 1946
Type or Record (always "Probate" or "Administration")	Administration London
delimits executor	3 May " to "
delimits taxable estate amount	Benjamin Kaye boot and shoemaker Effects £1082 9s. Id.

*Notes:* Many variations of the above were employed.

Table 2: General Entry Patterns

## Building the Data

- ▶ 'semi-clean' text files were imported to R and marked patterns in the text were found using *SQL* language (via the R package *sqldf*). The code converted the text to a database of rows and columns. Unique entries were identified and duplicates discarded.
- ▶ After this, individual fields were constructed from the relative position patterns.
  - ▶ Years and wealth were attributed.
- ▶ Much code was then devoted to cleaning the wealth measure as many entries had £ and shilling values conflated and post 1970 many records had the effects value conflated with a 10-digit record number
  - ▶ resulting in many decedents with astronomical levels of wealth!
- ▶ All nominal millionaires (over 4,000) were checked one by one
- ▶ Result every wealthholder in England, 1892-1992: A database of  $N = 15,152,822$

**SICH** Francis of Corney House Chiswick **Middlesex** died 13 February 1912 Probate **London** 20 March to Alexander Sich Alfred Sich and George Sich brewers. Effects £118107 1s. 3d.

viscount

**PORTMAN** the right honourable Gerald Berkeley seventh of The Manor Healing **Lincolnshire** died 3 September 1948 Probate (limited to settled land) **London** 23 April to the honourable Ian Leslie Melville banker and the most noble Edward William Spencer K.G. duke of Devonshire. Effects £4249000. Former Grant P.R. 21 February 1949.

**VANDERVELL** Guy Anthony of Brockhurst Park Stoke Poges **Suckinghamshire** and of 24 Sloane Avenue **London S.W.3** died 10 March 1967 at 16 Bryanston Square London W.1 Probate **London** 14 April to Gerard Wilfred White and Rudolph Edgar Francis de Trafford bankers and Joseph Leonard Reed solicitor. £10950146. Memorandum of Order dated 21 June 1968 under Section 28 of the Matrimonial Causes Act 1965 Annexed to Will.

**BERRY**, Benjamin of 3 Old Bank Ripponden nr Halifax West Yorks died 24 March 1953 Probate Leeds 22 April £ 821305196c

Figure 11: Examples of Problematic and unusually rich Entries

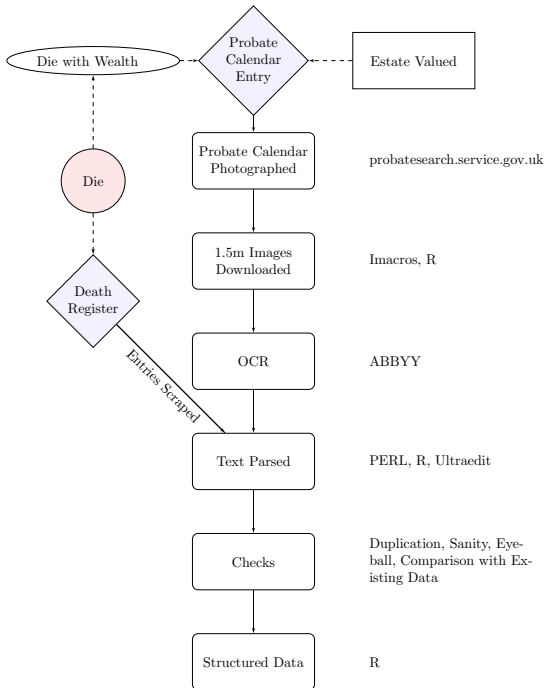
**ELLERMAN** C.H. sir John Reeves baronet of 1 South Audley-street **Middlesex** died 16 July 1933 at Hotel Royal Dieppe France Probate **London** 12 August to Frederick George Burt secretary and sir John Reeves Ellerman baronet.  
Effects £17224425 3s. 8d. Resworn £25817786 11s. 8d.

**VERNON** Thomas Thorneycroft of Shotwick Park near **Chester** died 24 January 1919 Probate **London** 5 April to John Herbert Vernon flour miller Thomas Cooper bank manager and Elizabeth Cooper Vernon spinster.  
Effects £324388 12s. 11d.

**CAYZER** sir Charles William of St. Lawrence Hall **Isle of Wight** of Gartmore **North Britain** and of 109 Hope-street **Glasgow** baronet died 28 September 1916 at Gartmore Probate **London** 24 January to August Bernard Tellefsen Cayzer and Herbert Robin Cayzer shipowners **Admiral** sir John Rushworth Jellicoe G.C.B. O.M. G.C.V.O. first sea lord of the **Admiralty** and Robert Alexander Hill solicitor.  
Effects £2204148 9s. 3d.  
Further Grant 3 October 1917.

**CAYZER** sir Charles William of St. Lawrence Hall **Isle of Wight** of Gartmore **North Britain** and of 109 Hope-street **Glasgow** baronet died 28 September 1916 at Gartmore Probate **London** 3 October to Harold Stanley Cayzer shipowner.  
Effects £1946676 11s. 7d.  
Former Grant January 1917.

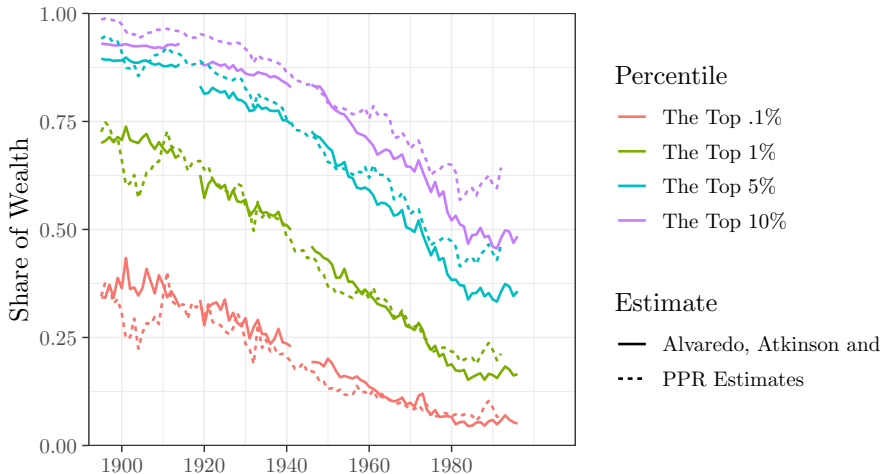




Rank	Name	Death Year	Place	Wealth	
				Nominal	Real
1	Sir John Reeves Ellerman, Baronet	1933	London	25,817,786	1,257,371,575
2	Henry Overton Wills	1911	Somerset	5,214,356	433,864,083
3	James Buchanan, 1st Baron Woolavington	1935	Cornwall	7,150,000	345,796,993
4	Charles Cross	1974	Hampshire	41,474,147	288,513,883
5	Wentworth Beaumont, Baron	1907	London	3,234,806	279,678,377
6	John Gretton	1899	London	2,883,640	265,401,845
7	Sir Andrew Barclay Walker	1893	Liverpool	2,876,781	260,701,343
8	Panaghi Athanarius Vagliano	1902	London	2,888,095	256,213,849
9	William Orme Foster	1899	Shropshire	2,587,681	238,162,639
10	William Louis Winans	1897	Brighton	2,522,005	233,821,183

Notes: 2015 prices.

Table 3: The 10 Richest English, 1892-1992



**Figure 13:** Comparing Different Estimates of Top Wealth Shares, England 1892-1992

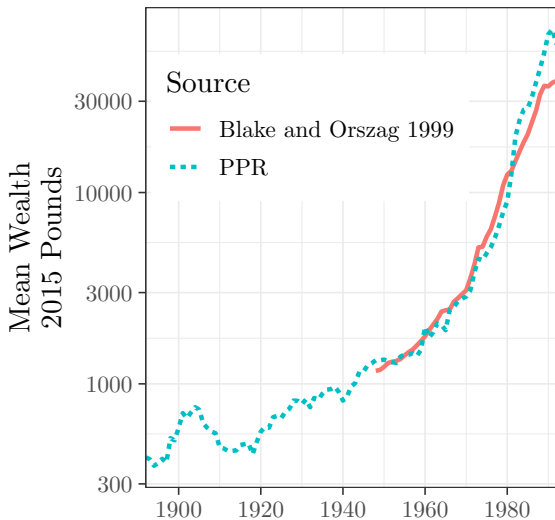


Figure 14: Comparing Average Wealth with Blake and Orszag (1999)

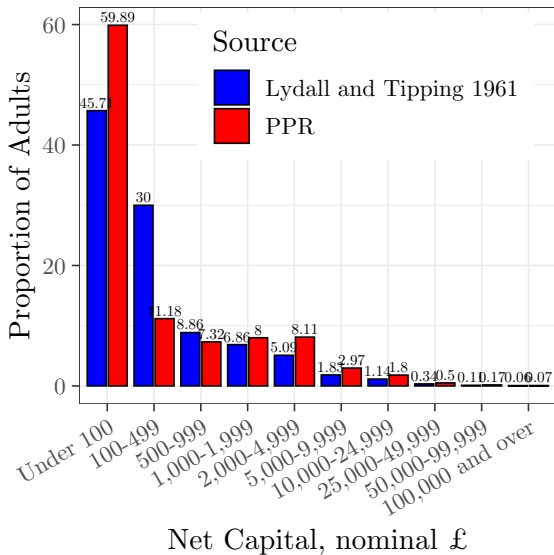


Figure 15: Comparison of Net Capital with Lydall and Tipping (1961), by Wealth Band, 1950s

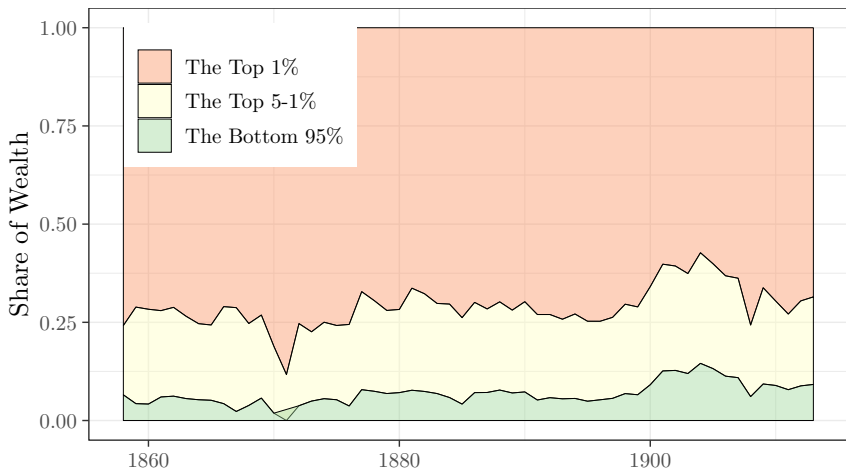


Figure 16: Top Wealth-Shares, pre-World War I

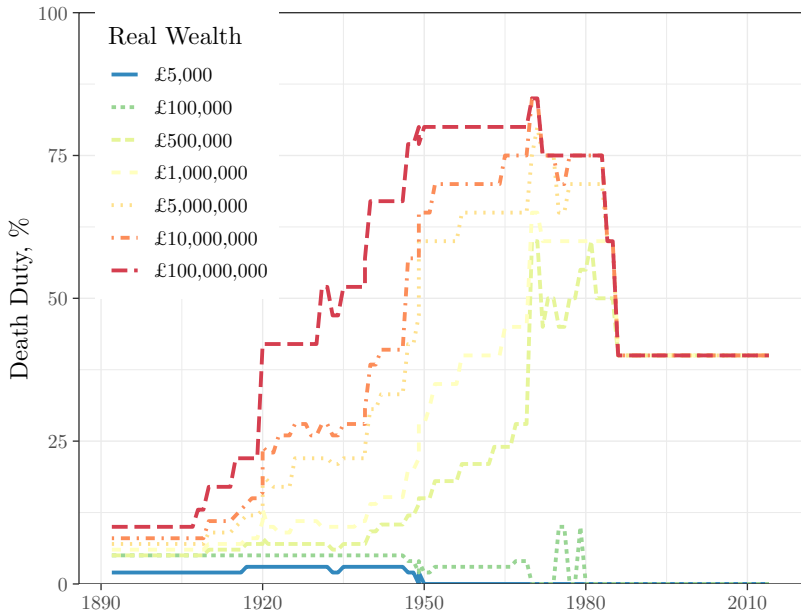


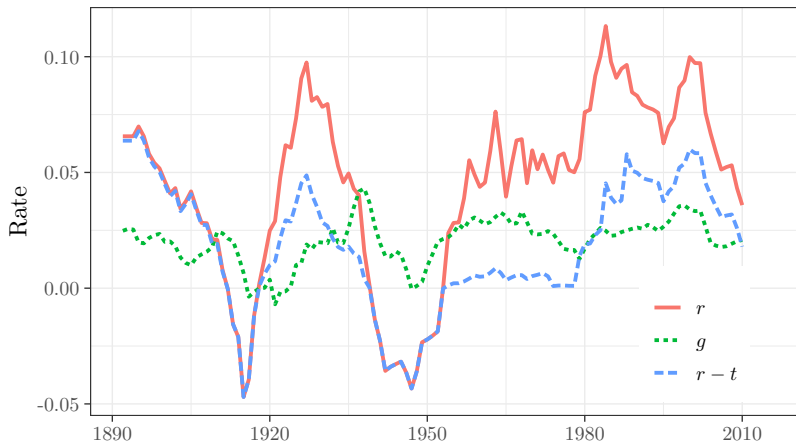
Figure 17: Death Duties, 1892-2015

	Year	Name	Real Wealth	Death Duties, %	Tax Paid
1	1933	Sir John Reeves Baronet Ellerman	1,257,371,575	52	653,833,219
2	1974	Charles Cross	288,513,883	75	216,385,412
3	1935	TRH James Woolavington	345,796,993	52	179,814,437
4	1957	James Armand De Rothschild	183,395,206	80	146,716,165
5	1958	William Stone	147,904,760	80	118,323,808
6	1940	TRH Marmaduke Furness	139,121,970	67	93,211,720
7	1940	Jack Bamato Joel	138,382,028	67	92,715,959
8	1929	Bernhard Baron	213,606,754	42	89,714,837
9	1974	James Henry Bryan	119,247,477	75	89,435,608
10	1935	Arthur Stanley-Wills	169,260,470	52	88,015,445
11	1946	William Johnston Yapp	128,326,006	67	85,978,424
12	1953	Hugh Richard Grosvenor*	105,630,735	80	84,504,588
13	1921	TRH Sir Ernest Joseph Cassel	199,628,495	42	83,843,968
14	1949	TRH Eleanor Countess Peel	102,871,973	80	82,297,579
15	1948	TRH Gerald Berkeley	105,111,626	77	80,935,952

Notes: 2015 prices. "TRH" = "The Right Honourable". \* 2nd Duke of Westminster.  
On #8:link

Table 4: The 10 Largest Taxpayers, 1892-1992





**Figure 18:** The Net-of-Taxes Rate of Return to Capital

*Source:* The real return on wealth,  $r$ , and the real GDP growth,  $g$ , Jordà et al. (2019), website. (For 1892-5, I use the average  $r$  1896-1899.) The highest rate of tax on capital income,  $t$ , Piketty (2014) <http://piketty.pse.ens.fr/files/capital21c/en/xls/>, spreadsheet Chapter14TablesFigures.xlsx. sheet "DetailsTS14.1UK", *Detailed series on UK top income tax rates (data provided by A.B. Atkinson, September 2011)*. Where  $r < 0$ ,  $t$  is set at 0, as taxes are not due on negative capital income. The figure plots decadal moving averages for visual clarity, annual figures are used in the analysis.

## Offshore Leaks

The *Offshore Leaks Database* by the International Consortium of Investigative Journalists (ICIJ) contains detailed account level information on 785,000 offshore companies, foundations and trusts from four recent data leaks;

1. The Paradise Papers (2017 and 2018, principally from the law firm Appleby),
2. The Panama Papers (2016, the law firm Mossack Fonseca),
3. The Bahamas Leaks (2016, official corporate registry)
4. The Offshore Leaks (2013, Portcullis Trustnet and Commonwealth Trust Limited).
  - ▶ There are more than 720,000 names of people and companies behind these Offshore accounts and I utilize these names in my analysis.

## Contemporary Outcomes: House Prices and Oxbridge Attendance

- ▶ All voters in the UK are listed in the *electoral roll*. I extracted the records of the 1999 UK *electoral roll* from a CD-ROM entitled UK-Info Disk (2000).
  - ▶ I then link the individual addresses from the electoral roll of 1999 to house price data by postcode in 2017 (from the land registry).
- ▶ Attendance at Oxford and Cambridge Universities is sourced from official publications and email directories (see Clark and Cummins (2014); Clark et al. (2014); Clark and Cummins (2015, 2018)).

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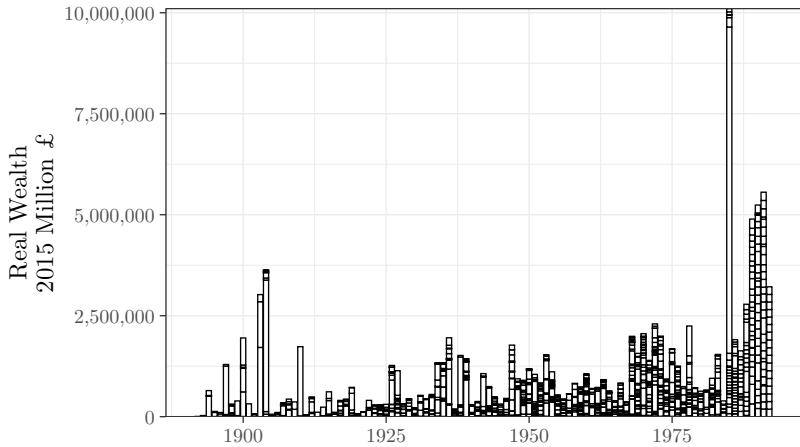


Figure 19: Cummins's

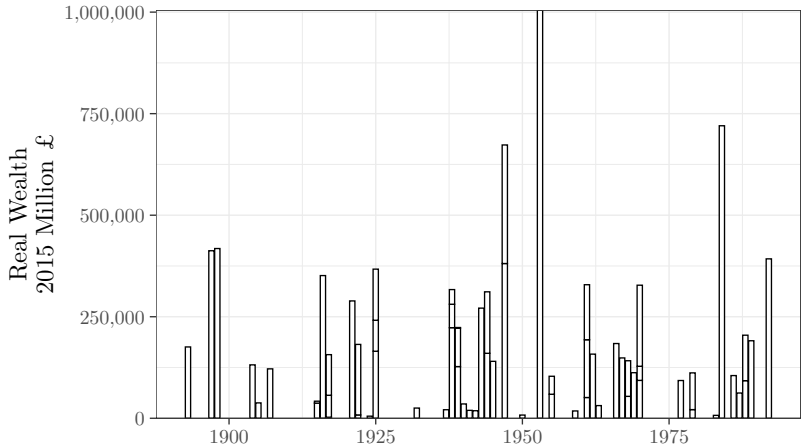


Figure 20: Comyns's

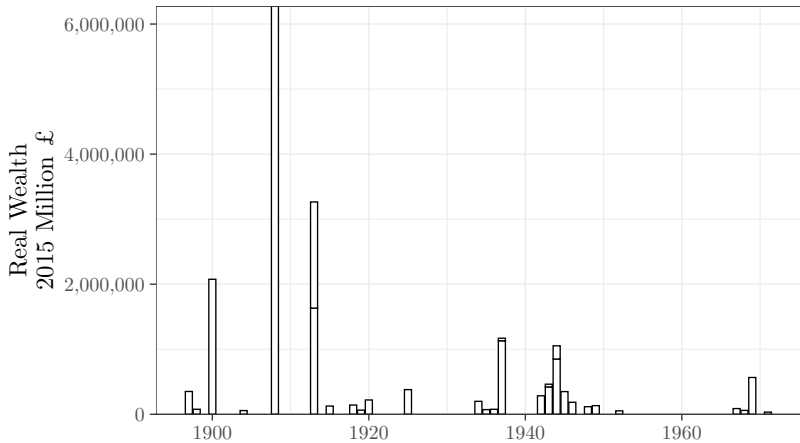


Figure 21: XXXXX's

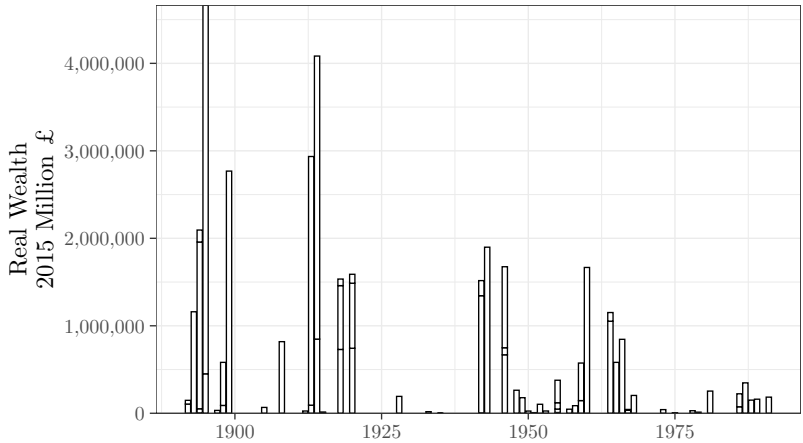


Figure 22: XXXXX's



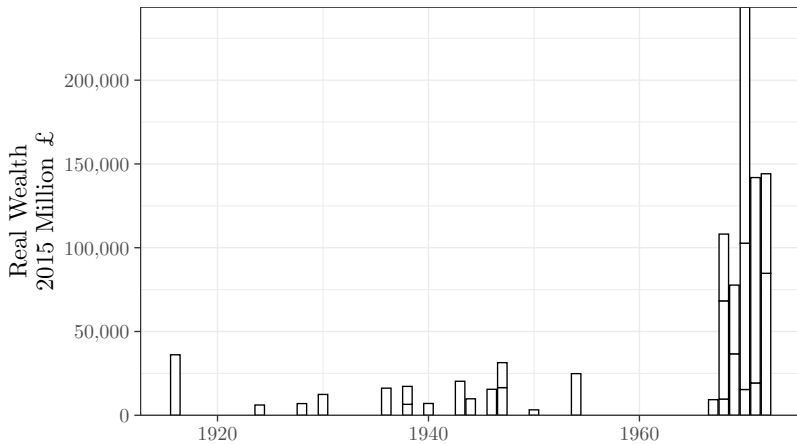


Figure 23: Dumpleton's

## Rare Surnames -> 'Dynasties'

- ▶ Surnames shared by 2-100 people in 1881
  - ▶ 36,719 surnames
  - ▶  $N = 1,049,250$
  - ▶  $N = 2,133,793$  in 2002
- ▶ Track their wealth 1892-1992
  - ▶ Top 1,500 = 'Victorian Elite'
- ▶ The rare surname level mirrors the individual level ->

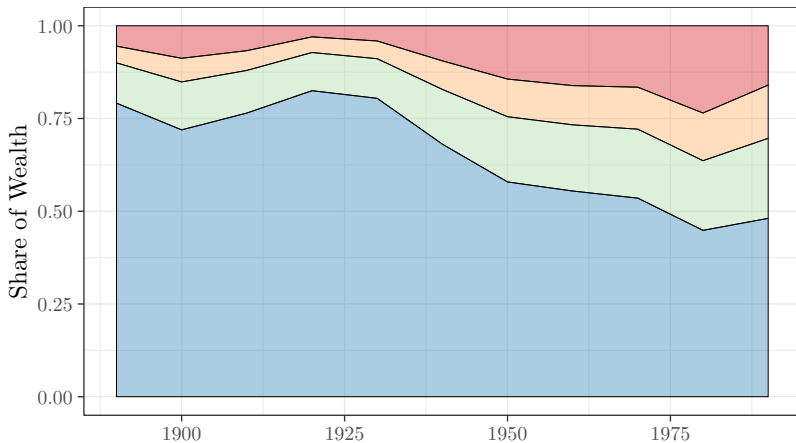


Figure 24: Observed Wealth Shares, Rare Surname Level, 1892-1992

Table 5: English Surname Extinction, 1881-2001

N Range, 1881	N, Surnames	N, 1881	N, 2001	Prop. Extinct
1	1,791	1,791	38,330	0.15
2-5	3,442	10,151	80,365	0.14
5-10	5,212	36,103	142,200	0.10
10-20	7,402	104,419	269,520	0.07
20-50	11,306	363,995	675,159	0.05
50-100	7,566	532,791	928,219	0.02
500-2,000	3,734	3,557,709	6,278,178	0.00
>2,000	1,680	13,607,051	24,335,967	0.00

*Note:* Calculated from the 1881 census (Schurer and Woollard (2000) and National Statistics (2002)

**Table 6:** English Surname Extinction, 1881-2001, Victorian Elite Dynasties

N Range, 1881	N, Surnames	N, 1881	N, 2001	Prop. Extinct	Ra
2-5	26	93	539	0.08	5.
5-10	68	458	2,054	0.12	4.
10-20	173	2,525	5,866	0.07	2.
20-50	542	18,547	32,733	0.03	1.
50-100	691	50,295	84,922	0.00	1.

*Note:* Calculated from the 1881 census (Schurer and Woollard (2000) and National Statistics (2002)

## Wartime Destruction

Wartime destruction,  $w_d$  of wealth,  $W$ , for surname  $j$  is calculated as

$$W_{wd} = \frac{\sum_{t=WarStart-5}^{WarStart} w_{jt} - \sum_{t=WarEnd}^{WarEnd+5} w_{jt}}{\sum_{t=WarStart-5}^{WarStart} w_{jt}} \quad (1)$$

where  $WarStart$  is the start year of the war (either 1918 or 1939) and  $WarEnd$  is the end of the war (1918 or 1945).

## Estimating 'Expected' Wealth, 1920-2018

$W^*$  at year  $t$  of of surname  $j$

$$W_{j,t}^* = \frac{\sum^{1920} W_j}{28} (1 + r_{1920}^{net})(1 + r_{1921}^{net}) \dots (1 + r_{t-1}^{net}) \quad (2)$$

where  $W$  is observed real wealth in any year, 1892-1920, growing at the net-of-taxes rate of return on capital,  $r^{net}$ , where taxes are the maximum tax rate on capital income ( $T^K$ ), estimated as

$$r^{net} = r - T^K \quad (3)$$

Cumulative tax paid ( $T^P$ ) is calculated as

$$T^P = \sum_{1920}^t T_t^D * W_{j,t}^{obs}$$

where as before death taxes are  $T^D$  and  $(1 - \alpha)W_{j,t}$  is observed wealth from the PPR calendars.

An upper limit on hidden wealth ( $HW$ ) from tax evasion and avoidance can then be calculated as the difference between the estimated 'true' lineage wealth minus cumulative death-taxes paid and *reported* lineage wealth at death

$$HW_{j,t} = W_{j,t}^* - \left[ W_{j,t}^{obs} + \frac{T^P}{30} \right] : W_{j,t}^* > W_{j,t}^{obs} + \frac{T^P}{30} \quad (4)$$

with  $\alpha$  calculated as

$$\alpha_{j,t} = \frac{HW_{j,t}}{W_{j,t}}$$



Note that  $HW$  must be greater than zero to be considered 'hidden'. Observed wealth that is in excess of that predicted by the level of inherited wealth, a  $HW$  of less than zero, is taken as a measure of new wealth ( $NW$ ), which is driven by the growth rate of the economy.

$$W_{j,t} = \left(\frac{1}{1-\alpha}\right) W_{j,t}^{obs} \quad (5)$$

Name	Variable	Source	Eq.
<i>Directly Observed</i>			
'True' Lineage Wealth	$W$	Probate Valuations 1892-1920	
Death Taxes	$T^D$	IR Tables, Figure 17	
Reported Wealth	$W^{obs} = (1 - \alpha)W$	Probate Valuations 1920-92	
<i>Taken from Other Studies</i>			
Return on $K$	$r$	Jordà et al. (2019)	
Tax on $K$ income	$T^K$	Piketty (2014)	
<i>Calculated</i>			
Taxes Paid	$T^P$	$T^D(1 - \alpha)W$	6
Net return on $K$	$r^{net}$	$r - T^K$	3
Expected Wealth	$W^*$	$(1 - \alpha)W(1 + r^{net})$	2
Hidden Wealth	$HW$	$[W^* - (W^{obs} + T^P)] > 0$	7
New Wealth	$-HW$	$(W^{obs} + T^P) - W^* < 0$	8
'True' Wealth, Inheritors	$W$	$W^* - T^P$	9
'True' Wealth, Non-Inheritors	$W$	$\frac{1}{1 - \alpha} W^{obs}$	10
Proportion Hidden	$\alpha$	$HW / W$	11

*Notes:* Estimated for rare surname  $j$  and time  $t$ . Summary terms for illustration, see text for detailed equations.

**Table 7:** Summary Table of Sources, Identities and equations for Estimating Lineage Wealth

# Contents

## Introduction

- The Idea
- The Background

## Data

- Building the Data
- Taxes Due at Death
- The Return on Capital and Capital Income Tax

## Methodology

- Observed Wealth, by Surname
- Tracking Surname 'Dynasties'
- Wartime Destruction
- Estimating 'Expected' Wealth, 1920-2018

## Results

- Wartime Destruction of Dynastic Wealth
- The Relative Contribution of Wartime Destruction and Taxes to Wealth Accumulation: A Simple Simulation**
- Estimated and Observed Lineage Wealth Accumulation**
- What is the Propensity to Hide Wealth?**

## How Much Wealth is Hidden? Surname Level Analysis

- The Proportion of Wealth Hidden and Newly Created Wealth, by Wealth Decile
- Is Hidden Wealth in Offshore Tax Havens?
- Hidden Wealth and Contemporary Outcomes: Housing Value and Oxbridge Attendance
- 'True' Inherited Wealth and the Decline of Elite Wealth. Accounting for the 'Great Equalization'

## Conclusion

Table 8: Wartime Destruction of Wealth, World War I

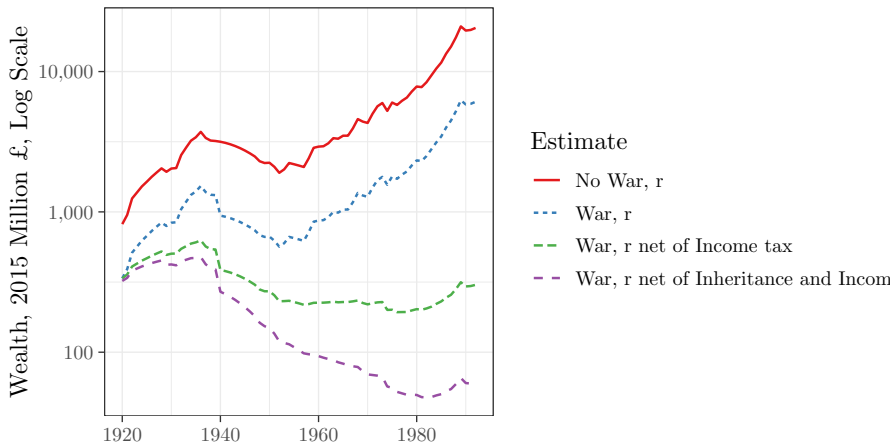
Victorian Wealth	Pre-War Wealth	Post-War Wealth	Prop. Destroyed	N
All	63,987	39,532	0.382	342,614
Elites	2,148	891	0.585	2,395
Middling	35	56	-0.590	894
Bottom	13	109	-7.285	1,643

*Note:* Wealth is in Millions, £2015. *Source:* 100% PPR Calendar Sample.

Table 9: Wartime Destruction of Wealth, World War II

Victorian Wealth	Pre-War Wealth	Post-War Wealth	Prop. Destroyed	N
All	90,516	76,019	0.160	623,136
Elites	1,501	1,111	0.259	4,521
Middling	213	187	0.123	2,639
Bottom	314	316	-0.007	5,285

*Note:* Wealth is in Millions, £2015. *Source:* 100% PPR Calendar Sample.



**Figure 25:** The effect of Wartime Destruction,  $r$ , and  $r$  net of income and inheritance taxes on Capital Accumulation

**Table 10:** The effect of War and Taxes on a fortune of £1 Billion in 1920 accumulating to 1992

Growth Path	Wealth, £bn. 1992	Lost Wealth	Prop. Loss
No War, r	20.46	0.00	0.000
War, r	6.09	14.37	0.702
War, r net of income tax	0.30	5.79	0.283
War, r net of inheritance an income tax	0.06	0.24	0.012

*Note:* Wealth is in Millions, £1920. *Source:* Simulation.

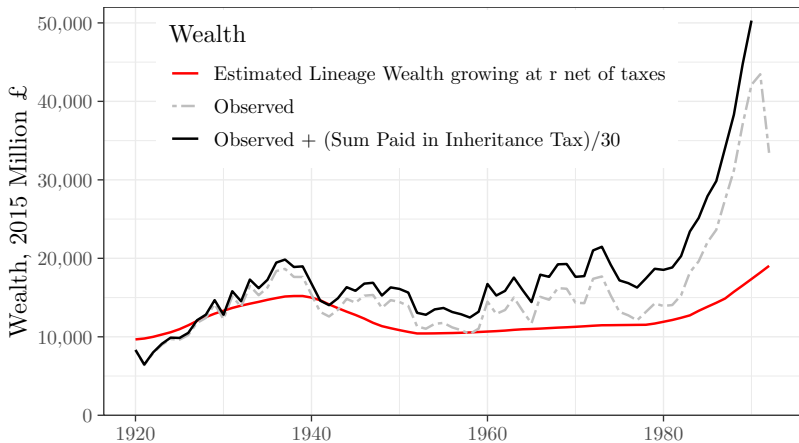


Figure 26: All



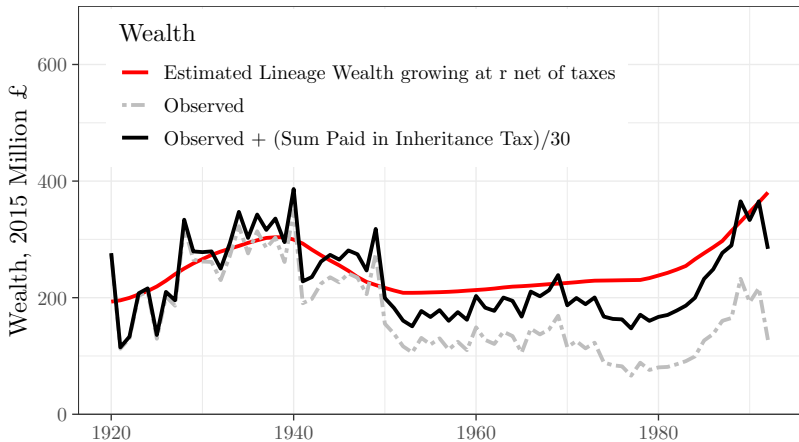


Figure 27: Victorian Elite Lineages

**Table 11:** Hidden Wealth and the Propensity to Hide, the Victorian Rare Elite, England 1920-1990

Decade	'True' Wealth	Observed Wealth	Observed + Paid in Inheritance Tax	Hidden Wealth	Prop. Hidden
1920	2,203	2,035	2,102	100	0.046
1930	2,894	2,787	3,040	-147	-0.051
1940	2,597	2,379	2,771	-174	-0.067
1950	2,106	1,242	1,714	392	0.186
1960	2,189	1,377	1,990	199	0.091
1970	2,292	962	1,748	544	0.237
1980-92	3,845	1,796	3,296	549	0.143

*Note:* Wealth is in Millions, £2015. *Source:* 100% PPR Calendar Sample.

# Contents

## Introduction

- The Idea
- The Background

## Data

- Building the Data
- Taxes Due at Death
- The Return on Capital and Capital Income Tax

## Methodology

- Observed Wealth, by Surname
- Tracking Surname 'Dynasties'
- Wartime Destruction
- Estimating 'Expected' Wealth, 1920-2018

## Results

- Wartime Destruction of Dynastic Wealth
- The Relative Contribution of Wartime Destruction and Taxes to Wealth Accumulation: A Simple Simulation
- Estimated and Observed Lineage Wealth Accumulation
- What is the Propensity to Hide Wealth?

## How Much Wealth is Hidden? Surname Level Analysis

- The Proportion of Wealth Hidden and Newly Created Wealth, by Wealth Decile
- Is Hidden Wealth in Offshore Tax Havens?
- Hidden Wealth and Contemporary Outcomes: Housing Value and Oxbridge Attendance
- 'True' Inherited Wealth and the Decline of Elite Wealth. Accounting for the 'Great Equalization'

## Conclusion

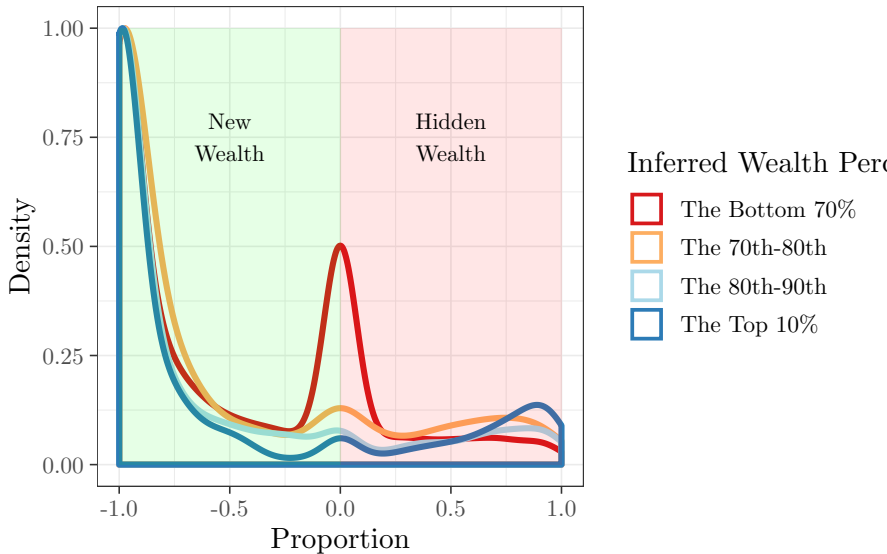


Figure 28: 1980-92

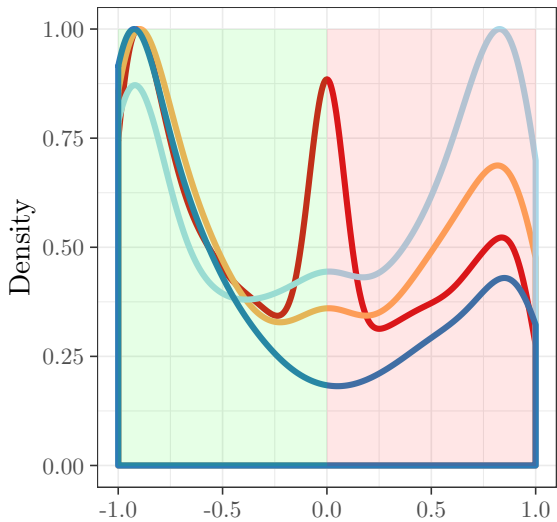


Figure 29: 1920-50

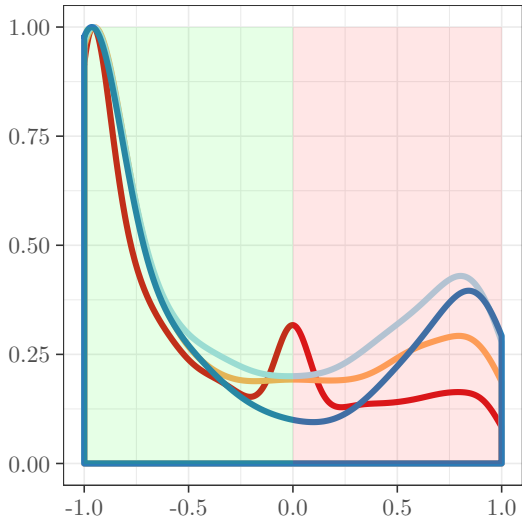


Figure 30: 1950-80

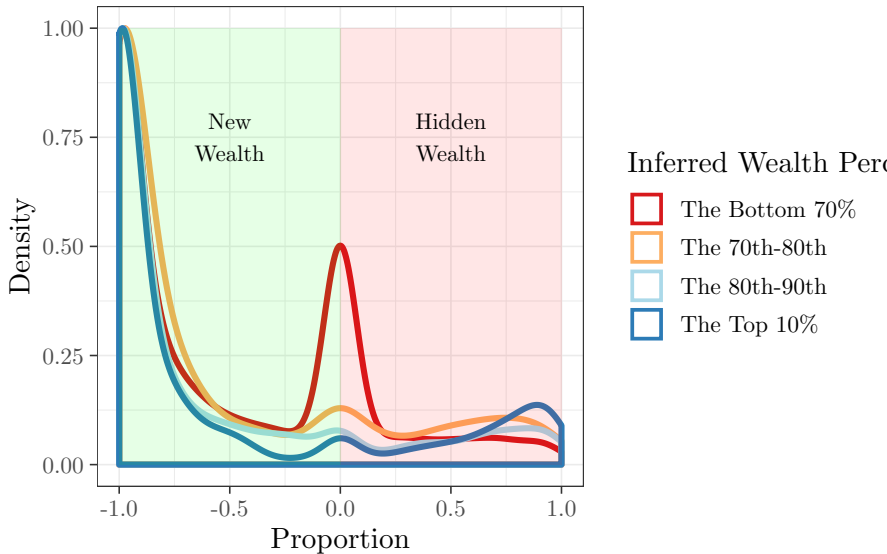


Figure 31: 1980-92

**Table 12:** Mean Proportion of Wealth Hidden, Surname Level

Inferred Wealth Percentile	Generation			N
	1920-50	1950-80	1980-92	
The Top 10%	.22	.23	.14	5,550
The 80th-90th	.34	.23	.10	5,616
The 70th-80th	.27	.18	.10	5,630
The Bottom 70%	.20	.12	.06	39,497

*Note:* Negative hidden wealth is set at zero. *Source:* 100% PPR Calendar Sample.



The general forms of the empirical models I apply to the surname level data are:

$$Y^j = c + \beta_1 \sum D_{OW}^j + \beta_2 X^j + \beta_3 \ln(N_{2002}^j) \quad (6)$$

$$Y^j = c + \beta_1 \sum D_{OW}^j + \sum \beta_{2i} D_{X_i} + \beta_3 \ln(N_{2002}^j) \quad (7)$$

$$X^j = \{D_{Hider}^j, HW^j, \alpha^j\} \quad (8)$$

$$Y^j = \{D_{Paradise}^j, H_{pcv}^j, OXB^j\} \quad (9)$$

Table 13: Summary Statistics, Rare Surname Level

Statistic	N	Mean	St. Dev.	Min	Median	Max
Generation	56,763	2	.82	1	2	3
N, Probated	56,763	7.70	8.20	0	5	149
N, 2002	56,763	78.92	72.84	0	58	597
Inferred Wealth	56,763	.61	1.95	0	.13	110.70
Observed Wealth	56,763	.87	5.94	0	.35	1,269.79
Tax Paid	56,763	.19	3.17	0	.01	508.84
Hidden Wealth	56,763	-.38	6.02	-1,269.79	-.13	79.17
Hidden Wealth (>0)	56,763	.23	1.31	0	0	79
Proportion Hidden	56,763	-.35	.65	-1	-.6	1
Proportion Hidden (>0)	56,763	.15	.29	0	0	1
Hide Any Wealth	56,763	.26	.44	0	0	1
Victorian Elite	56,763	.08	.27	0	0	1
In Paradise Leaks	18,921	.12	.32	0	0	1
N, Paradise	18,921	.68	2.67	0	0	35
House Value, 1999	18,126	334.45	305.41	7.26	289.25	14,750.00
Oxbridge Rate	18,921	.01	.02	0	0	0

Note: Wealth is in Millions, £2015. House prices are thousands, £.

Source: 100% PPR Calendar Sample.

# Wealth, Hidden Wealth and the Proportion of Hidden Wealth as Predictors of Presence in the Paradise Papers

	Paradise Dummy				
	(1)	(2)	(3)	(4)	(5)
Wealth Percentile: 70-80	1.121 [1.455]	1.089 [1.091]	1.114 [1.378]	1.120 [1.446]	1.122 [1.459]
80-90	1.142 [1.698]	1.105 [1.284]	1.137 [1.639]	1.139 [1.660]	1.143 [1.705]
The Top 10%	1.434 [4.691]***	1.378 [4.231]***	1.425 [4.605]***	1.426 [4.620]***	1.434 [4.693]***
$D_{Hider}$	1.262 [3.414]***				
Hidden Wealth		1.052 [2.385]*			
$HW: 0-.2m$			1.125 [1.114]		
$HW: .2m-1m$			1.295 [2.661]**		
$HW:>1m$			1.470 [2.864]**		
Prop. Hidden, $\alpha$				1.384 [3.042]**	
$\alpha: 0-.5$					1.281 [2.601]**
$\alpha .5-.75$					1.130 [.964]
$\alpha. 75-.9$					1.318 [1.860]
$\alpha>.90$					1.399 [2.064]*
$N_{2002}$	1.004 [12.928]***	1.004 [12.786]***	1.004 [12.942]***	1.004 [12.898]***	1.004 [12.929]***
Observations	15,975	15,975	15,975	15,975	15,975
Log Likelihood	-5,704.953	-5,707.971	-5,703.599	-5,706.159	-5,704.265
Akaike Inf. Crit.	11,421.910	11,427.940	11,423.200	11,424.320	11,426.530

Note: \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

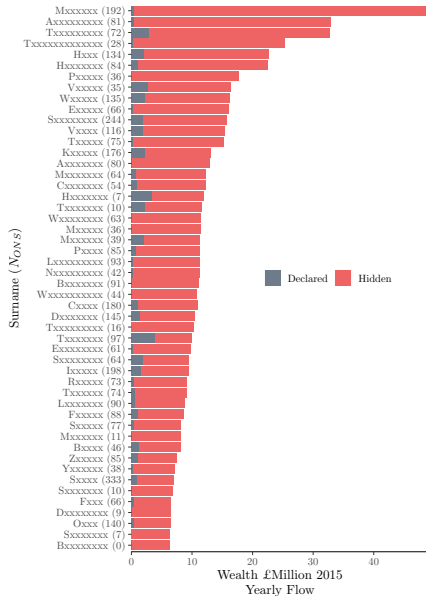


Figure 32: The Top 50 Hiding Dynasties, Hidden and Declared Wealth

Source: 100% PPR Calendar Sample.

# Wealth, Hidden Wealth and the Proportion of Hidden Wealth as Predictors of House Price in 1999

	House Price				
	(1)	(2)	(3)	(4)	(5)
Wealth Percentile: 70-80	17.5*	14.2	15.8*	18.1*	17.8*
	(7.6)	(7.6)	(7.6)	(7.7)	(7.7)
80-90	46.0***	42.1***	44.8***	46.3***	46.2***
	(7.8)	(7.8)	(7.8)	(7.9)	(7.9)
The Top 10%	94.8***	89.5***	93.0***	94.6***	94.9***
	(8.2)	(8.2)	(8.2)	(8.2)	(8.2)
$D_{Hider}$	39.3***				
	(6.6)				
Hidden Wealth		15.1***			
		(2.7)			
$HW: 0-.2m$			4.5		
			(10.0)		
$HW: .2m-1m$			47.3***		
			(9.6)		
$HW:>1m$			95.4***		
			(14.4)		
Prop. Hidden, $\alpha$				61.4***	
				(10.4)	
$\alpha: 0-.5$					28.5**
					(9.6)
$\alpha .5-.75$					51.4***
					(12.0)
$\alpha. 75-.9$					60.9***
					(14.9)
$\alpha>.90$					22.7
					(16.6)
$N_{2002}$	-.6***	-.6***	-.6***	-.6***	-.6***
	(.03)	(.03)	(.03)	(.03)	(.03)
Observations	18,126	18,126	18,126	18,126	18,126
$R^2$	.02	.02	.02	.02	.02

Note:

\*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$

Wealth is in 2015 Pounds, Per Annum flow

# Wealth, Hidden Wealth and the Proportion of Hidden Wealth as Predictors of Oxbridge Attendance Rate 1990-2016



	Oxbridge Attendance Rate (Z)				
	(1)	(2)	(3)	(4)	(5)
Wealth Percentile: 70-80	.101*** (.022)	.096*** (.022)	.098*** (.022)	.103*** (.022)	.103*** (.022)
80-90	.114*** (.023)	.108*** (.023)	.112*** (.023)	.116*** (.023)	.116*** (.023)
The Top 10%	.262*** (.024)	.253*** (.024)	.259*** (.024)	.263*** (.024)	.263*** (.024)
$D_{Hider}$	.067*** (.019)				
Hidden Wealth		.041*** (.008)			
HW: 0-.2m			-.007 (.029)		
HW: .2m-1m			.093*** (.028)		
HW:>1m			.167*** (.042)		
Prop. Hidden, $\alpha$				.119*** (.030)	
$\alpha$ : 0-.5					.029 (.028)
$\alpha$ : .5-.75					.092** (.034)
$\alpha$ : .75-.9					.107* (.043)
$\alpha$ >.90					.091 (.047)
$N_{2002}$	.002*** (.0001)	.002*** (.0001)	.002*** (.0001)	.002*** (.0001)	.002*** (.0001)
Observations	18,921	18,921	18,921	18,921	18,921
R <sup>2</sup>	.041	.042	.042	.041	.041

Note:

\*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$

Wealth is in 2015 Pounds, Per Annum flow.

No hidden wealth,  $\alpha = 0$  are the

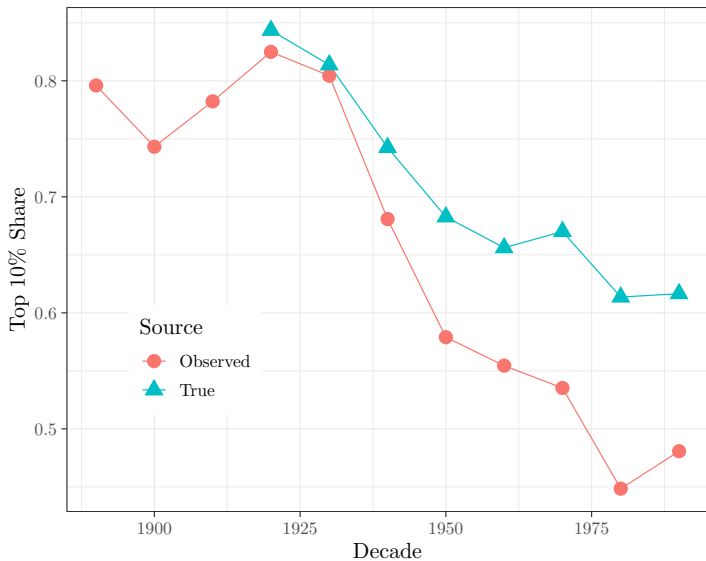


Figure 33: Top 10% Shares, Observed and 'True'

Notes: Calculated at the Rare Surname Level. Source: 100% PPR Calendar Sample.

# Contents

## Introduction

- The Idea
- The Background

## Data

- Building the Data
- Taxes Due at Death
- The Return on Capital and Capital Income Tax

## Methodology

- Observed Wealth, by Surname
- Tracking Surname 'Dynasties'
- Wartime Destruction
- Estimating 'Expected' Wealth, 1920-2018

## Results

- Wartime Destruction of Dynastic Wealth
- The Relative Contribution of Wartime Destruction and Taxes to Wealth Accumulation: A Simple Simulation
- Estimated and Observed Lineage Wealth Accumulation
- What is the Propensity to Hide Wealth?

## How Much Wealth is Hidden? Surname Level Analysis

- The Proportion of Wealth Hidden and Newly Created Wealth, by Wealth Decile
- Is Hidden Wealth in Offshore Tax Havens?
- Hidden Wealth and Contemporary Outcomes: Housing Value and Oxbridge Attendance
- 'True' Inherited Wealth and the Decline of Elite Wealth. Accounting for the 'Great Equalization'

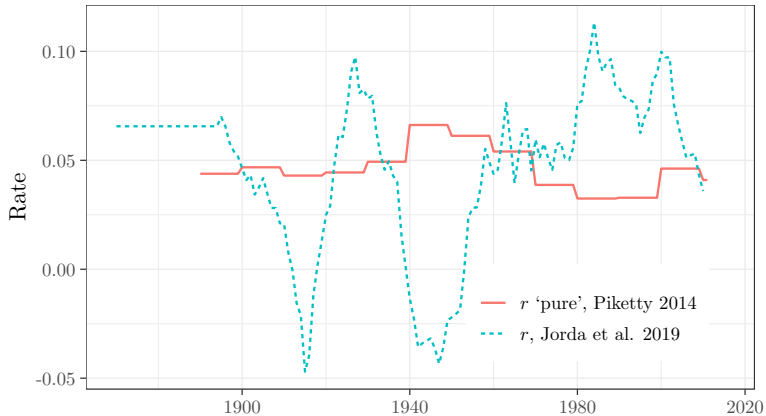
## Conclusion

## Conclusion

- ▶ In England, 1920-92, I find 8,839 dynasties that are hiding at least £7.4 Billion.
- ▶ Method could be applied to other countries
- ▶ Decline in wealth in equality may be entirely driven by Hidden Wealth

# Contents

Alternative Estimates using a Different Rate of Return on Capital



**Figure 34:** Estimates of Rate of Return to Wealth or Capital, Jorda et al. 2019 and Piketty 2014

*Source:* Jordà et al. (2019), website. (For 1892 to 1895, I use the 1896 value.)  
 Piketty (2014): <http://piketty.pse.ens.fr/files/capital21c/en/xls/>, spreadsheet Chapter6TablesFigures.xlsx. sheet "TS6.1".

**Table 14:** Hidden Wealth and the Propensity to Hide, the Victorian Rare Elite, England 1920-1990, Using Piketty (2014) rate of return on capital

Decade	'True' Wealth	Observed Wealth	Observed + Paid in Inheritance Tax	Hidden Wealth	Prop. Hidden
1920	2,222	2,045	2,110	112	0.050
1930	2,675	2,801	3,043	-368	-0.138
1940	2,055	2,380	2,831	-776	-0.378
1950	2,102	1,242	1,867	235	0.112
1960	2,214	1,377	2,158	56	0.025
1970	2,301	962	1,917	384	0.167
1980-92	3,292	1,795	3,322	-30	-0.009

*Note:* Wealth is in Millions, £2015. *Source:* 100% PPR Calendar Sample.

**Table 15:** Wealth, Hidden Wealth and the Proportion of Hidden Wealth as Predictors of Presence in the Paradise Papers and Contemporary Outcomes, comparison using alternative  $r$

	<i>logistic</i>		<i>OLS</i>		<i>OLS</i>	
	Paradise Dummy		House Price		Oxbridge Rate	
	Odds Ratio		000s of Pounds		Z-Score	
	(1)	(2)	(3)	(4)	(5)	(6)
	<i>J</i>	<i>P</i>	<i>J</i>	<i>P</i>	<i>J</i>	<i>P</i>
Wealth Percentile: 70-80	1.121*** (.079)	1.089*** (.079)	17.473* (7.647)	16.864* (7.655)	.101*** (.022)	.091*** (.022)
80-90	1.142*** (.078)	1.131*** (.079)	45.971*** (7.846)	48.117*** (7.863)	.114*** (.023)	.114*** (.023)
The Top 10%	1.434*** (.077)	1.398*** (.077)	94.781*** (8.237)	94.155*** (8.243)	.262*** (.024)	.262*** (.024)
$D_{Hider}$	1.262*** (.068)	1.265*** (.070)	39.263*** (6.583)	39.411*** (6.766)	.067*** (.019)	.058* (.019)
$N_{2002}$	1.004*** (.0003)	1.004*** (.0003)	-.566*** (.035)	-.567*** (.035)	.002*** (.0001)	.002*** (.0001)
Observations	15,975	15,975	18,126	18,126	18,921	18,921
$R^2$			.018	.018	.041	.041

Note:

\*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$

*J* uses Jorda et al. (2019)  $r$  series

*P* uses Piketty et al. (2014)  $r$  series

No hidden wealth is the omitted category

Oxbridge Rate is Z-Score

House Prices are in Thousands of 2018 Pounds



**Alstadsæter, Annette, Niels Johannesen, and Gabriel Zucman**, "Tax evasion and inequality," Technical Report, American Economic Review (Forthcoming) 2019.

**Alvaredo, Facundo, Anthony B. Atkinson, and Salvatore Morelli**, "Top wealth shares in the UK over more than a century," *Journal of Public Economics*, 2018, 162, 26 – 47. In Honor of Sir Tony Atkinson (1944-2017).

**Atkinson, Anthony B.**, "Wealth and Inheritance in Britain from 1896 to the Present," 2013.

— **and Allan J. Harrison**, *Distribution of personal wealth in Britain*, Cambridge Univ Pr, 1978.

— **, James P. F. Gordon, and Alan Harrison**, "Trends in the shares of top wealth-holders in Britain, 1923-1981," *Oxford Bulletin of Economics and Statistics*, 1989, 51 (3), 315–332.

**Blake, David and J. Michael Orszag**, "Annual estimates of personal wealthholdings in the United Kingdom since 1948," *Applied Financial Economics*, 1999, 9 (4), 397–421.

**Clark, Gregory and Neil Cummins**, "Surnames and Social Mobility in England, 1170–2012," *Human Nature*, Dec 2014, 25 (4), 517–537.

— **and** — , "Intergenerational Wealth Mobility in England, 1858–2012: Surnames and Social Mobility," *The Economic Journal*, 2015, 125 (582), 61–85.

— **and** — , "The Big Sort: Selective Migration and the Decline of Northern England, 1800-2017," 2018.

— , — , **Daniel Diaz Vidal, Yu Hao, Tatsuya Ishii, Zach Landes, Daniel Marcin, Kuk Kuk Mo Jung, Ariel Marek, and Kevin Williams**, *The Son Also Rises: Surnames and the History of Social Mobility: Surnames and the History of Social Mobility*, Princeton University Press, 2014.

**Harbury, C. D.**, "Inheritance and the Distribution of Personal Wealth in Britain," *The Economic Journal*, 1962, 72 (288), 845–868.

— **and D. M. W. N. Hitchens**, "The Inheritances of Top Wealth Leavers: Some Further Evidence," *The Economic Journal*, 1976, 86 (342), 321–326.

- **and** – , “Women, Wealth and Inheritance,” *The Economic Journal*, 1977, 87 (345), 124–131.
- **and P. C. McMahon**, “Inheritance and the Characteristics of Top Wealth Leavers in Britain,” *The Economic Journal*, 1973, 83 (331), 810–833.

**Harbury, CD and DM Hitchens**, *Inheritance and wealth inequality in Britain*, Allen & Unwin (London and Boston), 1979.

**I-CD Publishing**, *UK-Info Disk 2000 Standard* 2000.

**Lindert, Peter H.**, “Unequal English Wealth since 1670,” *The Journal of Political Economy*, 1986, 94 (6), pp. 1127–1162.

**Lydall, H. F. and D. G. Tipping**, “The Distribution of Personal Wealth in Britain,” *Bulletin of the Oxford University Institute of Economics & Statistics*, 1961, 23 (1), 83–104.

**National Statistics**, “Surnames, England & Wales,” 2002.

**Nicholas, Tom**, “Clogs to Clogs in Three Generations? Explaining Entrepreneurial Performance in Britain Since 1850,” *The Journal of Economic History*, 1999, 59 (3), 688–713.

**Óscar Jordà, Katharina Knoll, Dmitry Kuvshinov, Moritz Schularick, and Alan M Taylor**, “The Rate of Return on

Everything, 1870–2015,” *The Quarterly Journal of Economics*, 04 2019, 134 (3), 1225–1298.

**Piketty, Thomas**, *Capital in the Twenty-First Century*, Harvard University Press, 2014.

**Schurer, Kevin and Matthew Woollard**, “1881 Census for England and Wales, the Channel Islands and the Isle of Man (Enhanced Version) [computer file],” 2000.

**Zucman, Gabriel**, “The Missing Wealth of Nations: Are Europe and the U.S. net Debtors or net Creditors?\*,” *The Quarterly Journal of Economics*, 2013, 128 (3), 1321–1364.